

Miscellaneous Element Index

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Units: LF of Joint Seal

This element defines those expansion joint devices which utilize a neoprene type water proof gland with some type of steel extrusion or other system to anchor the gland. Report the estimated lineal feet in each of Condition States 2 and 3. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 and 3.

CDOT Note: For strip seal joints covered with a sliding plate, use the condition state language for Element 304 Open Expansion Joint, but code it as Element 300 Strip Seal Expansion Joint.

Condition State 1 The element shows minimal deterioration. **There is no leakage at any point along the joint.** Gland is secure and has no defects. Debris in joint is not causing any problems. The adjacent deck and/or header is sound.

Feasible actions: 1) DN

Condition State 2 **Signs of seepage** along the joint may be present. The **gland may be punctured ripped or partially pulled out** of the extrusion. Significant debris is in all or part of the joint. **Minor spalls in the deck and/or header may be present adjacent to the joint.**

Feasible actions: 1) DN
2) Patch/reset clean joint

Condition State 3 **Signs or observance of leakage along the joint** may be present. The **gland possibly has failed from abrasion or tearing.** The gland has **pulled out of the extrusion.** **Major spalls may be present in the deck and/or header adjacent to the joint.**

Feasible actions: 1) DN
2) Replace gland and patch concrete
3) Replace joint

Units: LF of Joint Seal

This element defines only those joints filled with a pourable sealant. Report the estimated lineal feet in each of Condition States 2 and 3. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 and 3.

CDOT Note: This element includes the joint filler poured on top of expansion joint material between the notch in the top of the abutment and the approach slab.

Condition State 1 The element shows minimal deterioration. Adhesion is sound with **no signs of leakage**. There are no cohesion cracks. The adjacent deck and/or header is sound.

Feasible actions: 1) DN

Condition State 2 **Minor adhesion and/or cohesion failures** may be present. Signs of seepage along the joint may be present. Joint may be slightly impacted with debris. Minor spalls in deck and/or headers may be present adjacent to the joint.

Feasible actions: 1) DN
2) Clean joint and replace seal

Condition State 3 **Major adhesion and/or cohesion failures** may be present. **Signs or observance of leakage along the joint** may be present. Joint may be heavily impacted with debris and/or stones. **Major spalls may be present in the deck and/or header adjacent to the joint.**

Feasible actions: 1) DN
2) Clean joint; patch spalls and replace seal

Units: LF of Joint Seal

This element defines only those joints filled with a pre-formed compression type seal. Report the estimated lineal feet in each of Condition States 2 and 3. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 and 3.

CDOT Note: For compression joint seals covered with a sliding plate, use the condition state language for Element 304 Open Expansion Joint, but code it as Element 302 Compression Joint Seal.

Condition State 1 The element shows minimal deterioration. Adhesion is sound with **no signs of leakage**. There are **no cohesion cracks**. The adjacent deck and/or header is sound. If joint is armored, there are **no signs of anchorage looseness**.

Feasible actions: 1) DN

Condition State 2 **Signs of seepage along the joint may be present.** There may be small adhesion failures. The gland may show signs of **abrasion or minor tearing**. Significant debris is in all or part of the joint. **Minor spalls in the deck and/or headers may be present adjacent to the joint.** If joint is armored, **looseness of the anchorage may be present.**

Feasible actions: 1) DN
 2) Patch/remove and reseal/clean joint

Condition State 3 **Major adhesion failures** may be present. The **gland may have failed from abrasion or tearing.** **Signs or observance of leakage** along the joint may be present. **Major spalls may be present in the deck and/or header adjacent to the joint.** If joint is armored, **the anchorage has failed.**

Feasible actions: 1) DN
 2) Replace gland and/or patch spalls
 3) Replace joint

Units: LF of Joint

This element defines only those joints that are open and not sealed. Report the estimated lineal feet in each of Condition States 2 and 3. The number of units in condition state 1 will be the remainder of the units after deducting those reported in Condition States 2 and 3.

CDOT Note: This element includes Finger Plate and Sliding Plate devices, but not sliding plates with a seal (they are either Element 300 Strip Seal Expansion Joint or Element 302 Compression Joint Seal).

Condition State 1 The element shows **minimal deterioration. Joint armor**, if present, **is secure** and there are **no bent, misaligned or broken fingers**. The **adjacent deck and/or header is sound**.

Feasible actions: 1) DN

Condition State 2 There may be **deck cracking indicating armor anchor loosening**. **Minor spalls** in the **deck and/or header** may be present **adjacent to the joint**. There may be **corrosion on joint armor steel plates**. **Bent or misaligned fingers** are observed.

Feasible actions: 1) DN
2) Rehab unit

Condition State 3 There may be **advanced corrosion of joint armor** or steel plates. **Major spalls** may be present in the **deck and/or header adjacent to the joint**. **Armor anchors have failed**. There are **missing or broken fingers**.

Feasible actions: 1) DN
2) Rehab unit
3) Replace unit

Units: LF of Joint Min Rpt Lgth = One Section GCD21

This element defines only those joints made of elastomeric seals bolted down to the supports, which are fused together during construction. These joints go by the proprietary names of **Waboflex, General Tire, etc.** Report the quantity of joint in Condition States 2 and 3. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 and 3.

CDOT Note: GCD21 - The minimum reporting length for damage limited to the joint is the section length of elastomeric flex-type joint. For joint anchorage zone damage, the reporting length is the sum of the damage lengths and is a multiple of the section length (say the section length is 6', the damage length reported will be 6', 12', 18'...).

Condition State 1 The element show minimal deterioration. The **bolt anchors are tight.** There may be **minor gouging or missing bolt caps.** There are **no broken pieces.** The adjacent deck is sound. There is no leakage.

Feasible actions: 1) DN

Condition State 2 The element may show signs of **gouging or minor tearing.** There may be **loose sections or missing bolts.** **Minor spalls** in the deck may be present adjacent to the joint. **Minor leakage** in the joint may be present.

Feasible actions: 1) DN
 2) Repair joint
 3) Replace joint

Condition State 3 The joint may show **signs of failure from gouging or tearing.** There may be **missing sections or failed anchors.** **Significant spalls** may be present in the deck adjacent to the joint. **Significant leakage** in the joint is present.

Feasible actions: 1) DN
 2) Repair joint
 3) Replace joint

Units: LF of Joint

This element defines only those joints which are **constructed of layers of rubberized asphalt** leaving no actual opening in the driving surface. Report the quantity of joint in Condition States 2 and 3. The number of units in Condition State 1 will be the remainder of the units after deducting those reported in Condition States 2 and 3.

Condition State 1 There are **no significant cracks and no leakage.**

Feasible actions: 1) DN

Condition State 2 There **is significant cracking and leakage.**

Feasible actions: 1) DN
2) Repair joint

Condition State 3 **Substantial cracking** has caused the device to fail, **allowing water to have significant impact** on other elements.

Feasible actions: 1) DN
2) Repair joint
3) Replace joint

Units: LF of Joint

This element defines only those joints made up of modules of continuous elastomeric strip or box seals. These devices are usually found on long bridges built since the mid-1980's. Report the quantity of joint in Condition States 2 and 3.

Condition State 1 The element shows minimal deterioration. **All seals are held tight.** The adjacent deck is sound. There is **no leakage.**

Feasible actions: 1) DN

Condition State 2 The element may show signs of **minor tearing.** There **may be loose seals.** **Minor spalls** in the deck may be present adjacent to the joint. **Minor leakage** in the joint may be present.

Feasible actions: 1) DN
2) Repair joint
3) Replace joint

Condition State 3 The joint may **show signs of failure from tearing.** **Seals may be missing.** **Significant spalls** may be present in the deck adjacent to the joint. **Significant leakage** in the joint is present.

Feasible actions: 1) DN
2) Repair joint
3) Replace joint

Units: LF of Joint

This element defines transverse non-expansion joints in decks - filled and unfilled - and longitudinal deck construction joints. The non-expansion joints may be filled with cork, fiber board, or similar material at the time of construction or they may not be filled. The joint may have a tar type seal poured on top of the filler material. The longitudinal deck construction joints include full depth construction joints, such as those used between different stages of construction and widenings and between prestressed "T" girders without a top deck. Report only the estimated lineal feet of joint in Condition States 2 and 3.

CDOT Note: This element does not include transverse deck cold joints in continuous decks at the end of a pour.

Condition State 1 The element shows no deterioration, but **may have very minor leakage**. The filler material is still in place. There may be **minor "D" cracking along the joint**. The **construction joints show no distress**, there **may be very minor leakage**.

Feasible actions: 1) DN

Condition State 2 The **filler material** is still in place, but may be **starting to slip down**. There is **considerable leakage through the joint**. There may be **moderate "D" cracking along the joint**. The **construction joints show moderate leakage**.

Feasible actions: 1) DN
2) Seal the joint with a pourable seal

Condition State 3 The **filler material has fallen out and the joint is open**. There is **heavy "D" cracking with or without rebars exposed**. The **construction joints show heavy leakage**.

Feasible actions: 1) DN
2) Seal the joint with a pourable seal
3) Repair "D" cracking, install backing material, and seal joint with a pourable seal

Units: Each

This element defines only those bridge bearings that are constructed primarily of elastomers, with or without fabric or metal reinforcement inside, which have a metal sole plate with teflon sliding surface. Report the number of bearings in Condition States 2 and 3. The number of bearings in Condition State 1 will be the total number of bearings at the bridge less those reported in Condition States 2 and 3.

Condition State 1 The element shows **no cracking or splitting**. There are **no shear deformations**. Vertical and horizontal alignment is within limits.

Feasible actions: 1) DN

Condition State 2 **Minor cracking, splitting or other deterioration may be present. Minor deformation** may be present. Bearing alignment is still tolerable. Strength and/or serviceability are not affected.

Feasible actions: 1) DN
2) Reset bearings

Condition State 3 Advanced deterioration. **Significant deformations** may be present. **Top and bottom surfaces may no longer be parallel**. Loss of bearing may be imminent. The teflon and/or alignment may be failed.

Feasible actions: 1) DN
2) Reset bearings
3) Replace bearings

Units: Each

This element defines only those bridge bearings that are constructed primarily of elastomers, with or without fabric or metal reinforcement. Report the number of bearings in each of Condition States 2 and 3. The number of bearings in Condition State 1 will be the total number of bearings at the bridge less those reported in Condition States 2 and 3.

CDOT Notes: When this element is used, DO NOT use Element 311 Movable Bearing (Roller, Sliding, etc.) or Element 313 Fixed Bearing for the steel sole plates or masonry plates. The condition of the steel sole or masonry plates shall be documented in the comments for Element 310 Elastomeric Bearing.

Do not use this element for leveling pads 1/2" or less.

Condition State 1 The element shows little or no deterioration. Shear deformations are correct for existing temperatures.

Feasible actions: 1) DN

Condition State 2 **Minor cracking, splitting or other deterioration may be present. Shear deformation may be slightly excessive.** Strength and/or serviceability are not affected.

Feasible actions: 1) DN
2) Reset bearings

Condition State 3 Advanced deterioration. **Shear deformations may be excessive. Top and bottom surfaces may no longer be parallel.** Loss of bearing may be imminent.

Feasible actions: 1) DN
2) Reset bearings
3) Replace unit & reset girders

Units: Each

This element defines those bridge bearings that provide for both deflection and longitudinal movement by means of roller, rocker or sliding mechanisms. Report the number of bearings in each of Condition States 2 and 3. The number of bearings in Condition State 1 will be the total number of bearings at the bridge less those reported in Condition States 2 and 3.

Condition State 1 The element shows little or no deterioration. If a paint system is present, it is sound and functioning as intended to protect the metal. The bearing has **minimal debris and corrosion**. Vertical and horizontal alignment is within limits. **Bearing support member is sound**. Any lubrication system is functioning properly.

Feasible actions: 1) DN

Condition State 2 The paint system, if present, may show **some corrosion with minor pitting**. The assemblies may have moved enough to cause **minor cracking in the supporting concrete**. **Debris build-up is affecting bearing movement**. Bearing alignment is still tolerable.

Feasible actions: 1) DN
2) Rehab supports and/or reset bearing devices

Condition State 3 **Corrosion is advanced**. There may be **loss of section of the supporting member sufficient to warrant supplemental supports** or load restrictions. Bearing alignment may be beyond tolerable limits. **Shear Keys may have failed**. The lubrication system, if any, may have failed.

Feasible actions: 1) DN
2) Rehab supports
3) Replace unit

Units: Each

This element defines those bridge bearings that provide for deflection only. Report the number of bearings in each of Condition States 2 and 3. The number of bearings in Condition State 1 will be the total number of bearings at the bridge less those reported in Condition States 2 and 3.

CDOT Note: GCD04 - When pulpits or saddles have been added to restore the bearing area, the condition of the bearing may be restored to Condition State 1, however the damaged portion of the girder will continue to be reported. The pulpit or saddle should be coded as Element 313 Fixed Bearing. Do not count the original bearing if a pulpit or saddle has been placed beneath the girder.

Condition State 1 The element shows little or no deterioration. If a paint system is present, it is sound and functioning as intended to protect the metal. Vertical and horizontal alignment is within limits. **Bearing support member is sound.** Any lubrication system is functioning properly.

Feasible actions: 1) DN

Condition State 2 The paint system, if present, may show **some corrosion with minor pitting.** The assemblies may have moved enough to cause **minor cracking in the supporting concrete.**

Feasible actions: 1) DN
2) Clean & paint or rest bearings and/or rehab supports

Condition State 3 **Corrosion is advanced.** There may be **loss of section of the supporting member sufficient to warrant supplemental supports or load restrictions.** **Shear Keys may have failed.** The lubrication system, if any, may have failed.

Feasible actions: 1) DN
2) Rehab supports or bearings
3) Replace unit

Units: Each

This element defines those high load bearings with confined elastomer. The bearing may be fixed against horizontal movement, guided to allow sliding in one direction, or floating to allow sliding in any direction. Report the number of bearings in Condition States 2 and 3. The number of bearings in Condition State 1 will be the total number of bearings at the bridge less those reported in Condition States 2 and 3.

Condition State 1 The element shows minimal deterioration. The paint or other anticorrosion system is sound and functioning as intended to protect the metal. The bearing has **minimal debris and corrosion**. Vertical and horizontal alignment is within limits. **Bearing support member is sound**. Any lubrication system is functioning properly.

Feasible actions: 1) DN

Condition State 2 The anti-corrosion system may show **some corrosion with minor pitting**. **Debris build-up is affecting bearing movement**. Bearing alignment and load carrying capacity is still tolerable.

Feasible actions: 1) DN
2) Rehab supports or bearing devices.

Condition State 3 **Corrosion is advanced. Bearing alignment and load carrying capacity may be beyond limits. Shear keys and the lubrication system, if any, may have failed. Elastomer may be actively extruding** from the device.

Feasible actions: 1) DN
2) Rehab bearing devices
3) Replace unit

Units: Each

This element defines those high load bearings with a hard plastic disk. The bearing may be fixed against horizontal movement, guided to allow sliding in one direction, or floating to allow sliding in any direction. Report the number of bearings in Condition State 1 will be the total number of bearings at the bridge less those reported in Condition States 2 and 3.

Condition State 1 The element shows minimal deterioration. The paint or other anticorrosion system is sound and functioning as intended to protect the metal. The bearing has **minimal debris and corrosion**. Vertical and horizontal alignment is within limits. **Bearing support member is sound**. Any lubrication system is functioning properly.

Feasible actions: 1) DN

Condition State 2 The anti-corrosion system may show **some corrosion with minor pitting**. **Debris build-up is affecting bearing movement**. Bearing alignment and load carrying capacity is still tolerable.

Feasible actions: 1) DN
2) Rehab supports or bearing devices.

Condition State 3 **Corrosion is advanced. Bearing alignment and load carrying capacity may be beyond limits. Shear keys and the lubrication system, if any, may have failed.**

Feasible actions: 1) DN
2) Rehab bearing devices
3) Replace unit

Units: Each

This element defines those structural sections between the bridge abutment and the approach pavement that are constructed of prestressed concrete. These structural sections may be separated into multiple slabs by longitudinal joints (there may be one approach slab per traffic lane or there may only be one approach slab for the entire bridge approach). They may or may not have asphalt overlay.

CDOT Notes: GCD02 - Bridges with approach slabs will have a quantity for the type of joint between the abutment backwall and the approach slab. Also, approach slabs that are on "sleeper slabs" at the end away from the bridge will have a quantity for the type of joint over the "sleeper slab". This joint is between the approach slab and the concrete roadway pavement. If there is a question about there being a "sleeper slab" you should refer back to the plans, if plans are not available, then treat it as not having a "sleeper slab". The total quantity of approach slabs is usually two, however it may be more.

Approach spans that cannot be inspected shall be coded and treated as an approach slab. The total quantity is usually two, but not greater than four (for parallel bridges with a closed median with one structure number). When approach spans are accessible, the appropriate elements shall be coded and quantities reported. The number of spans for the bridge include approach spans which are accessible.

Railroad bridges with approach slabs which are covered with ballast that cannot be inspected should not have the approach slab element coded. Mention the existence of the approach slab in the abutment element comment field.

Condition State 1 The slab has **not settled** and shows no sign of deterioration other than **superficial surface cracks**.

Feasible actions: 1) DN

Condition State 2 **Minor cracking, spalls may be present** but they do not affect the ability of the slab to carry traffic. **Settlement may be occurring** which increases the traffic impact on the bridge.

Feasible actions: 1) DN
 2) Perform mudjacking operations

Condition State 3 **Cracks may extend completely through the slab cross-section, but the slab does not act as if it is broken. Spalls may be heavy** but they do not affect the structural integrity of the slab. **Settlement may be occurring** which increases the traffic impact on the bridge.

Feasible actions: 1) DN
 2) Place overlay

3) Replace unit

Condition State 4 The **slab is broken or rocks under traffic loads. Settlement is excessive** and cannot be corrected without increasing the size of the slab.

Feasible actions: 1) DN
 2) Replace unit

Units:Each

This element defines those structural sections between the bridge abutment and the approach pavement that are constructed of reinforced concrete. These structural sections may be separated into multiple slabs by longitudinal joints (there may be one approach slab per traffic lane or there may only be one approach slab for the entire bridge approach). May or may not have asphalt overlay.

CDOT Notes: GCD02 - Bridges with approach slabs will have a quantity for the type of joint between the abutment backwall and the approach slab. Also, approach slabs that are on "sleeper slabs" at the end away from the bridge will have a quantity for the type of joint over the "sleeper slab". This joint is between the approach slab and the concrete roadway pavement. If there is a question about there being a "sleeper slab" you should refer back to the plans, if plans are not available, then treat it as not having a "sleeper slab". The total quantity of approach slabs is usually two, however it may be more.

Approach spans that cannot be inspected shall be coded and treated as an approach slab. The total quantity is usually two, but not greater than four (for parallel bridges with a closed median with one structure number). When approach spans are accessible, the appropriate elements shall be coded and quantities reported. The number of spans for the bridge include approach spans which are accessible.

Railroad bridges with approach slabs which are covered with ballast that cannot be inspected should not have the approach slab element coded. Mention the existence of the approach slab in the abutment element comment field.

Condition State 1 The slab has **not settled** and shows no sign of deterioration other than **superficial surface cracks**.

Feasible actions: 1) DN

Condition State 2 **Minor cracking, spalls may be present** but they do not affect the ability of the slab to carry traffic. **Settlement may be occurring** which increases the traffic impact on the bridge.

Feasible actions: 1) DN
2) Perform mudjacking operations

Condition State 3 **Cracks may extend completely through the slab** cross-section, but the **slab does not act as if it is broken**. **Spalls may be heavy** but they do not affect the structural integrity of the slab. **Settlement may be occurring** which increases the traffic impact on the bridge.

Feasible actions: 1) DN
2) Place overlay
3) Replace unit

Condition State 4 **The slab is broken or rocks under traffic loads**. **Settlement is excessive** and cannot be corrected without increasing the size of the slab.

Feasible actions: 1) DN
2) Replace unit

Units: Each

This element defines the slope (**embankment or fill**), slope protection, and berm under the bridge. It includes soil, slope paving, riprap, gabions, rock filled baskets, sub-abutments, mechanically stabilized earth, etc.

CDOT Note: This element is not to be used for scour prevention or repair around piers, full height abutments or wingwalls.

Condition State 1 The element may have **insignificant settlement, erosion, or may have been pulled away from the abutment less than 3"** or **there is less than 3"** of exposed piling. There may be little erosion beneath the edges. **Any cracks or displacements are insignificant.** There may be an **erosion trough in the slope less than 1' deep.**

Feasible actions: 1) DN

Condition State 2 There may be **moderate settlement, erosion, and or pulling away from the abutment greater than 3"** or there is **3" to 1' of piling exposed.** The concrete paving slabs may have **moderate structural cracks,** or there may be **moderate voids** beneath sections. The **majority** of the slope protection is **still in place and is functional.** There may be an **erosion trough** in the slope **1' to 3' deep.**

Feasible actions: 1) DN
2) Repair unit

Condition State 3 There may be **major settlement, erosion, greater than 1' of piling exposed,** the concrete paving slabs may be **buckled or broken,** or there may be **major erosion** under the slope paving. The **original slope protection could be missing,** causing the slope to be substantially unprotected. There may be an **erosion trough** in the slope **greater than 3' deep.**

Feasible actions: 1) DN
2) Rehab unit
3) Replace slope protection

Units: Each

This element defines walls non-integral with the abutments and are usually flared to support the roadway embankment.

CDOT Note: Wingwalls are defined as any portion outside of the out to out of the deck and includes that portion of U-shaped abutments that parallel the roadway. Any piling in the wingwall is included in the unit and not counted separately.

Condition State 1 There may be **minor pushing and/or insignificant cracking** but the **joint is near tight**. There may be minimal deterioration, **small spalls in concrete or minor surface rot on timber**. **R1 corrosion** on piles and/or backwalls. There may be **little erosion**.

Feasible actions: 1) DN

Condition State 2 There may be **moderate active pushing or separation** due to settlement and the **joint is open**. There may be **disintegration of the concrete surfaces or some section loss of the timber due to rot**. **R2 corrosion** on piles and/or backwalls. There may be **moderate erosion** at joint or around end.

Feasible actions: 1) DN
2) Rehab wall

Condition State 3 There may be **major active pushing or separation** and the **joint is open**. There may be wide **structural cracks** and or **major disintegration** or there is **major section loss to the timber**. **R3/R4 corrosion** on piles and/or backwalls. There may be **major erosion**.

Feasible actions: 1) DN
2) Rehab wall
3) Replace wall

Units: Each

This element defines walls non-integral with the culvert ends and are usually flared to support the roadway embankment.

CDOT Note: Wingwalls are the portions outside of the out-to-out of the culvert. Any piling in the wingwall is included in the unit and not counted separately.

Condition State 1 There may be **minor pushing and/or insignificant cracking** but the **joint is near tight**. There may be minimal deterioration, **small spalls in concrete or minor surface rot on timber**. **R1 corrosion** on piles and/or backwalls. There may be **little erosion**.

Feasible actions: 1) DN

Condition State 2 There may be **moderate active pushing or separation** due to settlement and the **joint is open**. There may be **disintegration of the concrete surfaces or some section loss of the timber due to rot**. **R2 corrosion** on piles and/or backwalls. There may be **moderate erosion** at joint or around end.

Feasible actions: 1) DN
2) Rehab wall

Condition State 3 There may be **major active pushing or separation** and the **joint is open**. There may be wide **structural cracks** and or **major disintegration** or there is **major section loss to the timber**. **R3/R4 corrosion** on piles and/or backwalls. There may be **major erosion**.

Feasible actions: 1) DN
2) Rehab wall
3) Replace wall

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